

Rejections under 35 U.S.C. §103(a)

*Elsermans combined with
Iwasaki and Kuramoto¹*

All of claims 1, 4 - 7 and 25 have been finally rejected under 35 U.S.C. §103(a) as unpatentable over Elsermans combined with Iwasaki and Kuramoto.

Elsermans is applied as showing a method of forming a full color (yellow, magenta, cyan) image, with non-contact fixing, wherein the yellow color toner image is closer to the receiving material than any other color toner image. Elsermans does not mention the specific yellow, magenta and cyan toners to which all of the present claims are limited, or the melt viscosity and haze factor limitations set forth in those claims.

Iwasaki is applied as showing use of color toners respectively containing the three specific color toner pigments recited in the present claims, to form a full color image. Iwasaki employs contact fixing and does not disclose that the toners have a melt viscosity not greater than 120 mPas•sec at 140°C, or that they provide color images each having a haze factor not greater than 20% when the images have a weight of 8 g/m² and are fixed. It is the Examiner's position, however, that for reasons set forth at pp. 6-7 of the Office Action dated 12/27/2005, "it is reasonable to presume that the Iwasaki color toners produce color images having the haze factor recited in the instant claims," i.e., that the haze factor limitation of the present claims is inherent in the Iwasaki toners.

¹In each ground of rejection, Iwasaki is applied as evidenced by two Chemical Abstracts citations, a citation to Industrial Organic Pigments, and "applicants' admissions I," and Kuramoto is applied as evidenced by "applicants' admissions II."

Kuramoto is applied as disclosing color toners including a polyol binder resin synthesized by reacting an epoxy resin, a dihydric phenol, and either an alkylene oxide adduct of a dihydric phenol or a glycidyl ether thereof. Kuramoto employs contact fixing and does not disclose that the toners have a melt viscosity not greater than 120 mPas•sec at 140°C, or that they provide color images each having a haze factor not greater than 20% when the images have a weight of 8 g/m² and are fixed.

In an Office Action mailed 4/21/2005, at p. 3, the Examiner acknowledged that

"Applicants have shown that the Iwasaki color toners do not have a melt viscosity as recited in the instant claims, and that the Iwasaki [patent], alone or combined with the other cited references, does not teach or suggest color toners having the melt viscosity recited in the instant claims."

Nevertheless, it is now the Examiner's position that for reasons set forth at pp. 8-9 of the Office Action dated 12/27/2005, "it is reasonable to presume that toners comprising the Kuramoto polyol binder resin have a melt viscosity as recited in instant claims 1 and 25," i.e., that the melt viscosity limitation of the present claims is inherent in toners made with the resin of Kuramoto, and (*ibid.*, p. 10) that it would have been obvious

"to use the Kuramoto polyol resin as the binder resin in the color toners disclosed by Iwasaki, such that the resultant color toners have a melt viscosity as recited in the instant claims and provide color images with good color reproducibility, good light transmission, and uniform gloss,"

these being attributes ascribed by Kuramoto to the resin. Further, the Examiner asserts that it would have been obvious to use the resultant toners in the Elsermans image forming method

because there would be a "reasonable expectation" of obtaining the benefits taught by Iwasaki and Kuramoto.

This rejection is predicated on a double presumption of inherence of undisclosed physical properties in novel (though assertedly obvious) compositions of matter, and on the contention that this double presumption shifts to applicants the burden of proving non-inherence, under the authority of *In re Fitzgerald*, 205 U.S.P.Q. 594 (C.C.P.A. 1980). *Fitzgerald*, however, does not go so far. In that case, the Court observed that the burden shifted because "it appears that the fasteners [in the primary reference] . . . are either identical with or only slightly different from appellants' fasteners." *Id.* at 596. Here, in contrast, no toner composition described in any one of Elsermans, Iwasaki and Kuramoto is "either identical with or only slightly different from" any of the color toners employed in applicants' claimed method.

Moreover, applicants submit that the claims are not *prima facie* obvious from the references as applied, but distinguish patentably thereover, because the haze factor limitation of the claimed invention is not inherent in the teaching of Iwasaki, and therefore would not have been inherent in the asserted combination of Iwasaki and Kuramoto with Elsermans. As explained in applicants' response to the last previous Office Action, Examples 2 and 4 of the present specification demonstrate that whether the claimed haze factor property was or was not achieved in those instances depended on whether the master batch-forming mixture was kneaded five times with the three-roll mill or passed through the three-roll mill twice, using otherwise virtually identical ingredients and process conditions. If one followed the described procedure of applicants' Example 2 or 4 without the teaching of extent of kneading, it would be mere happenstance whether the haze factor property was achieved or not; and it is well settled that

in such a case, the property cannot be deemed to be inherent in the product as taught.

By a parity of reasoning, in applicants' view, since Iwasaki Example 13 (incorporating Master Batch Preparation Example 1) fails to specify the extent of such kneading, the haze factor property should not be considered to be inherent in the teaching of Example 13.

The Examiner dismisses applicants' submission as "mere attorney argument," but it is based on the evidence set forth in the Examples of the specification, which show (in the direct comparison provided by Examples 2 and 4) the dependence of the haze factor property on the extent of master batch kneading. Iwasaki, in Master Batch Preparation Example 1, describes mixing in a Henschel mixer "at a peripheral speed of 40 m/sec. for 4 minutes," after which "The resulting mixture was melted and kneaded in a twin-screw kneader-extruder," but the patent is silent as to the extent or duration of such kneading (see col. 17, lines 23-35).

The Examiner also notes that applicants' Example 1 describes production of a yellow toner with a haze factor of 17% wherein the pigment-binder resin master batch is passed through a three roll mill twice, "the same number of times exemplified in example 4," but "in example 1, the mixture had been kneaded and pulverized before passage through the three-roller mill." Applicants' Example 1, however, is more specific than this: it states that the pigment-resin mixture for the resin batch "was kneaded at 150°C for 30 minutes" and, after addition of xylene, "the mixture was further kneaded for one hour," before removing xylene and water, cooling, pulverizing and passing the mixture "through a three-roll mill twice."

Although applicants' specification provides no data directly comparable to their Example 1 as to the effect of lesser kneading,

it seems reasonable to infer that the 1-1/2 hours of kneading time before passage of the master batch twice through the three-roll mill made up for the lesser number of passes through that mill (as compared to applicants' Example 2) in attaining the haze factor property of the present claims.

That is to say, applicants' Example 1 data if anything reinforce the conclusion, indicated by comparison of their Examples 2 and 4, that the extent of master batch kneading determines whether applicants' recited haze factor property is attained.

At issue is whether it is reasonable to transfer to applicants the burden of showing that their haze factor property is not inherent in the toners of Iwasaki Example 13. Since Master Batch Preparation Example 1 of Iwasaki does not specify the extent of kneading (in a twin-screw kneader-extruder), the haze factor property of applicants' claims would be inherent in the Iwasaki Example 13 toners only if it were necessarily and inevitably achieved by the performance of the procedure of that example (and the associated Master Batch Preparation Example 1) regardless of the extent of kneading of the master batch pigment-resin mixture. Applicants respectfully submit that this is not a reasonable presumption in light of the data set forth in the Examples of their own specification showing the relation between haze factor property and extent of master batch kneading.

If (as applicants believe) it is not reasonable to presume that their haze factor property is inherent in the toners specifically described in Iwasaki's examples, then, applicants further submit, the method of their claims is not *prima facie* obvious from the asserted combination of references, because there is no intimation in any of the references that a haze factor property is a result-effective variable, much less any suggestion of how to select or control it. The Examiner speculates that the

toner image haze factor depends on the degree of dispersion of the pigment (though, to support this conjecture, the Office Action relies on applicants' own specification, which is not available as a reference) and contends that Iwasaki teaches that mixing at high shear and prior mixing (to enhance dispersion) are result-effective variables, noting also the Iwasaki teaching that "its color toners are capable of providing fixed full color images with good color reproducibility and transparency" (Office Action dated 7/24/2006, pp. 9-10). But even assuming *arguendo* the correctness of the Examiner's conjecture as to the relation between dispersion and haze factor, there is nothing to lead a person of ordinary skill in the art to seek or achieve the haze factor property limitation of applicants' present claims.

Additionally, applicants submit that their claimed method is not *prima facie* obvious from the references as applied, because either it would not have been obvious to use the resin of Kuramoto in the toners of Iwasaki, or the melt viscosity limitation of their claims is not inherent in the resin of Kuramoto and therefore would not have been inherent in (or obvious from) the asserted combination of references.

Iwasaki teaches that it is desirable that the binder resin should have "melting viscosity" V_2 at 100°C of 5×10^4 to 1×10^6 poise, and that the ratio of "melting viscosity" V_1 of the binder resin at 90°C to V_2 should be 8 or more (col. 9, lines 1 - 12). Applicants have pointed out (see Amendment filed March 31, 2005, pp.8-9) that Iwasaki's "desirable" binder resin would have a melt viscosity at 140°C far above their claimed limit, and the Examiner has acknowledged that "the Iwasaki color toners do not have a melt viscosity as recited in the instant claims" (Office Action dated 4/21/2005, p. 3). Nevertheless, observing that "Iwasaki does not limit the type of toner binder resin used," the Examiner asserts that "it is reasonable to presume that toners comprising the

Kuramoto polyol binder resin have a melt viscosity as recited in" applicants' claims (Office Action dated 12/27/2005, p. 10), and that it would have been obvious to use the Kuramoto resins in the Iwasaki toners.

But, while Iwasaki may not positively limit the type of resin, the teaching of a "desirable" or preferred melt viscosity property that is inferentially far above applicants' upper limit points away from the use of a resin within applicants' upper limit, and is consequently significant from the standpoint of obviousness. Thus, if use of the Kuramoto resin would inherently satisfy the melt viscosity limitation of the present claims (as the Examiner presumes), its substitution for the resins of Iwasaki, in Iwasaki toners, would be contrary to the teaching of Iwasaki, and therefore not obvious.

On the other hand, if use of the Kuramoto resin in the Iwasaki toners would not inherently provide a melt viscosity not greater than 120 mPas•sec at 140°C, then the asserted combination of Kuramoto and Iwasaki with Elsermans would not meet or make obvious the method defined in applicants' independent claims 1 and 25, because there is no express disclosure in any of these references that would motivate an artisan of ordinary skill to so modify their combined teachings as to use toner compositions meeting the recited melt viscosity limitation.

Finally, applicants submit that even if the combination of features defined in their claims 1 and 25 could be said to be *prima facie* obvious, they have demonstrated that the combination achieves unexpected beneficial results that are entitled to patentable weight.

Each of the present claims (all of which are directed to a method of forming a full color image) is expressly limited to a combination of features at least including, *inter alia*:

- (a) non-contact fixing;

- (b) use of specified yellow, magenta and cyan colorants, and
- (c) positioning the yellow color toner images closer to the receiving material than any other color toner image.

As applicants' specification explains (p. 2, lines 14-23), problems concerning color reproducibility have heretofore been encountered when non-contact fixing methods have been used, and in addition, "the color toner images generally have poor light resistance." The specification further sets forth (p. 6, lines 23-27) that use of the specific set of yellow, magenta and cyan colorants of feature (b) above, with non-contact fixing (feature (a)), in accordance with the invention, "can produce color images having better image qualities than conventional color toners," although "the image qualities of the color images are inferior to those of the color images fixed by a roller fixing method." When, in addition, feature (c) is provided -- i.e., when the yellow toner image has the lowest position in color toner images overlaid on a receiving material -- "the image qualities [with non-contact fixing] are as good as those of the color toner images fixed by a roller fixing method" (specification, p. 7, lines 1-7).

This beneficial result is demonstrated by the Examples and Comparative Examples of applicants' specification, all of which employ non-contact fixing. Examples 1 - 4 are examples of the present invention. Comparative Example 1 uses the same set of toners as feature (b) of the invention but does not place the yellow toner image closest to the receiving material. Comparative Examples 2 and 3 do have the yellow image lowermost but employ yellow and magenta colorants not included within feature (b) although they use the same blue colorant as feature (b). The data set forth in Table 1 of the specification and represented in FIGS. 1-3 of the drawings illustrate the clear superiority of the Examples of the invention over any of the Comparative Examples.

The Examiner has heretofore asserted that the showing of unexpected results in the Examples and Comparative Examples in applicants' specification "is not commensurate in scope with the instant claims because instant examples 1-4 comprise combinations of preferred embodiments recited in original dependent claims 2-7, which are not recited in" original claim 1. These "preferred embodiments" are

- (i) "a haze factor not greater than 20%" (claim 2);
- (ii) "a melt viscosity not greater than 120 mPas•sec" (claim 3);
- (iii) "a polyol resin..." as binder (claim 4);
- (iv) the polyol resin comprises "a reaction product of: (a)...; (b)...; and either (c)... or (c')..." (claim 5);
- (v) "an aromatic hydroxycarboxylic acid metal salt" (claim 6);
- (vi) "the metal" of the salt "is zinc" (claim 7).

Claim 1, as previously amended to incorporate the recitals of now-cancelled claims 2 and 3, is expressly limited to the combination of features (i) and (ii) with the aforementioned features (a), (b) and (c); claim 4, dependent on 1, is expressly limited to the combination of feature (iii) with features (i), (ii) and (a), (b) and (c); claim 5, dependent on 4, is expressly limited to the combination of feature (iv) with features (i), (ii), (iii) and (a), (b) and (c); claim 6, dependent on 1, is expressly limited to the combination of feature (v) with features (i), (ii) and (a), (b) and (c); and claim 7, dependent on 6, is expressly limited to the combination of feature (vi) with features (i), (ii) and (v) and (a), (b) and (c). Claim 25 is expressly limited to all of features (i)-(vi) as well as to the aforementioned features (a), (b) and (c). Thus, the "welter of unconstrained variables" to

which the Examiner alluded in dismissing applicants' showing of unexpected results has been considerably winnowed in each of the claims now in the application -- and, in the case of claim 25, eliminated altogether.

Moreover, insofar as these "preferred embodiments" are present in the four Examples of the invention set forth in applicants' specification, they are also present in the three Comparative Examples of the specification. Comparative Example 1 differs from Example 1 only in the order of toner layers (i.e., in Comparative Example 1, the yellow layer is formed on the magenta or cyan layer in the red and green images). Comparative Example 2 differs from Example 1 only in replacing the yellow and magenta pigments with those of Toner Manufacturing Example 5, which had haze factors within the limit of claim 2 and melt viscosities within the limit of claim 3. The black toner of Comparative Example 2 was identical to that of Example 1, containing a salt as defined in claims 6 and 7; the cyan toner was also identical, and the same resins were used in all the toners of both Example 1 and Comparative Example 2. Like correspondences and differences existed between Comparative Example 3 and Example 2.

Thus, the Comparative Examples in the specification differed from the Examples of the claimed invention in the specification essentially only with respect to the order of toner layers or the yellow and magenta pigments used (all of which are features recited in claim 1), and not with respect to the presence or absence of any of the "preferred embodiment" features of claims 2 - 7. The Examples met all the limitations of claim 1; the Comparative Examples did not.

Since all factors other than features of claim 1 were thus effectively unchanged as between the Examples and Comparative Examples, it is submitted that the data in the specification fairly establish that the improved results are obtained from the

combination of pigments and layer order recited in claim 1. Consequently, the showing of unexpected beneficial results in the specification is properly commensurate in scope with claim 1.

In this regard, it is further submitted that present claim 1 may be regarded as defining a subcombination of the complete combination of features or "preferred embodiments" listed by the Examiner as discussed above. The only elements of the complete combination omitted from claim 1 are the particular type of resin employed, and the metal salt. Examples 1-4 of the invention differ from Comparative Examples 1-3 only in respect of features of this subcombination. Hence, considered together, the Examples and Comparative Examples of applicants' specification demonstrate that as used in the complete combination of method features, the claimed subcombination provides unexpected beneficial results. This showing is believed clearly adequate to support the patentability of claims to the subcombination.

The Examiner has heretofore also asserted that applicants' showings of unexpected beneficial results are insufficient because, *inter alia*, they "have not shown that the non-contacting fixing step recited in instant claim 1 provides unexpectedly superior results over Iwasaki." But what applicants have shown is the superiority of their results, in terms of image qualities obtained with *non-contact* fixing, over *non-contact* fixing methods that do not employ the combination of features recited in claim 1. Thereby, the invention enables the benefits of non-contact fixing to be realized without the drawbacks of inferior image qualities heretofore associated with non-contact fixing. This is in itself a beneficial result, which does not require any showing of better image quality than *contact* fixing methods using the same toners and order of arrangement of the images; and it is unexpected, since none of the references suggests that the combination of

features recited in claim 1 could overcome or mitigate the image quality problems of non-contact fixing.

In summary, applicants submit that the recital of the aforementioned combination of features (a), (b), (c), (i) and (ii) distinguishes each of claims 1 and 25, and claims 4 - 7 (dependent on claim 1) patentably over Elsermans, Iwasaki and Kuramoto and any proper combination thereof.

*Other grounds of
rejection under §103(a)*

All of claims 1, 4 - 7 and 25 have also been finally rejected under 35 U.S.C. §103(a) as unpatentable over the following additional combinations of references: Aoki combined with Moser, Iwasaki and Kuramoto; Takahashi combined with Moser, Iwasaki and Kuramoto; Hata combined with Moser, Iwasaki and Kuramoto; and Iwasaki combined with Kuramoto, McNally and Moser.

In each of these grounds of rejection, Iwasaki and Kuramoto are applied as in the rejection on Elsermans combined with Iwasaki and Kuramoto, for the propositions that the recited haze factor property and melt viscosity property are *prima facie* obvious. The same considerations set forth above are submitted to rebut each of these assertions of *prima facie* obviousness. Further, it is submitted that applicants' demonstrated beneficial results, also discussed above, would not have been expected from any of these additional combinations of references (in which Aoki and Moser, Takahashi and Moser, Hata and Moser, and McNally and Moser are applied for substantially the same method features as Elsermans), and are entitled to patentable weight in distinguishing claims 1, 4 - 7 and 25 patentably over each asserted group of references.

Obviousness-Type Double Patenting

In response to the obviousness-type double patenting rejection, submitted herewith is a terminal disclaimer effective to overcome that ground of rejection.

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For the foregoing reasons, it is believed that this application is now in condition for allowance. Favorable action thereon is accordingly courteously requested.

Respectfully,

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I hereby certify that this paper is being deposited this date with the U.S. Postal Service as first class mail addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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